Army Science Board

Enabling Rapid and Decisive Strategic Maneuver for the Army After 2010

Abridged Summary

Army Science Board Mission

The Army Science Board (ASB) will provide the Army with a resource of world-class scientists, engineers, technologists and operational experts as well as business, policy and managerial specialists who will volunteer their expertise and time to address those ***critical national security challenges*** for which the Army's leadership seeks ***independent and unbiased technical advice***. ASB will focus on issues of importance to large segments of the Army, and its "products" will be delivered in a ***candid, timely*** and ***tailored*** fashion.

"I Skate to Where the Puck Is Going to Be"

Wayne Gretzky

- 1947 Army Air Force Report, *"Where We Stand"*
  - predicted next generation Air Force technologies
- Report made ***projections*** that "for future planning of research and development were ***considered fundamental realities***."
  - Possibility of supersonic flight
  - Unmanned aerodynamic systems capable of delivering weapons payloads at ranges of up to several thousands of miles
  - Target-seeking antiaircraft missiles
  - Supersonic offensive systems to penetrate the new antiaircraft systems'
  - Systems for perfect communication between fighters and ground control stations
  - All-weather navigation systems.

These imagined capabilities became reality within a generation !!

Strategic Maneuver

Strategic Maneuver is the ability to ***project military power rapidly from all points of the globe*** to ***converge simultaneously*** with overwhelming land, air, space, and maritime forces that paralyze and dominate the enemy. The objective is to ***wrest the operational initiative, achieve dominance, and prevent or terminate conflict by defeating the enemy*** or setting the conditions for sustained decisive operations of follow-on campaign forces if they are necessary.

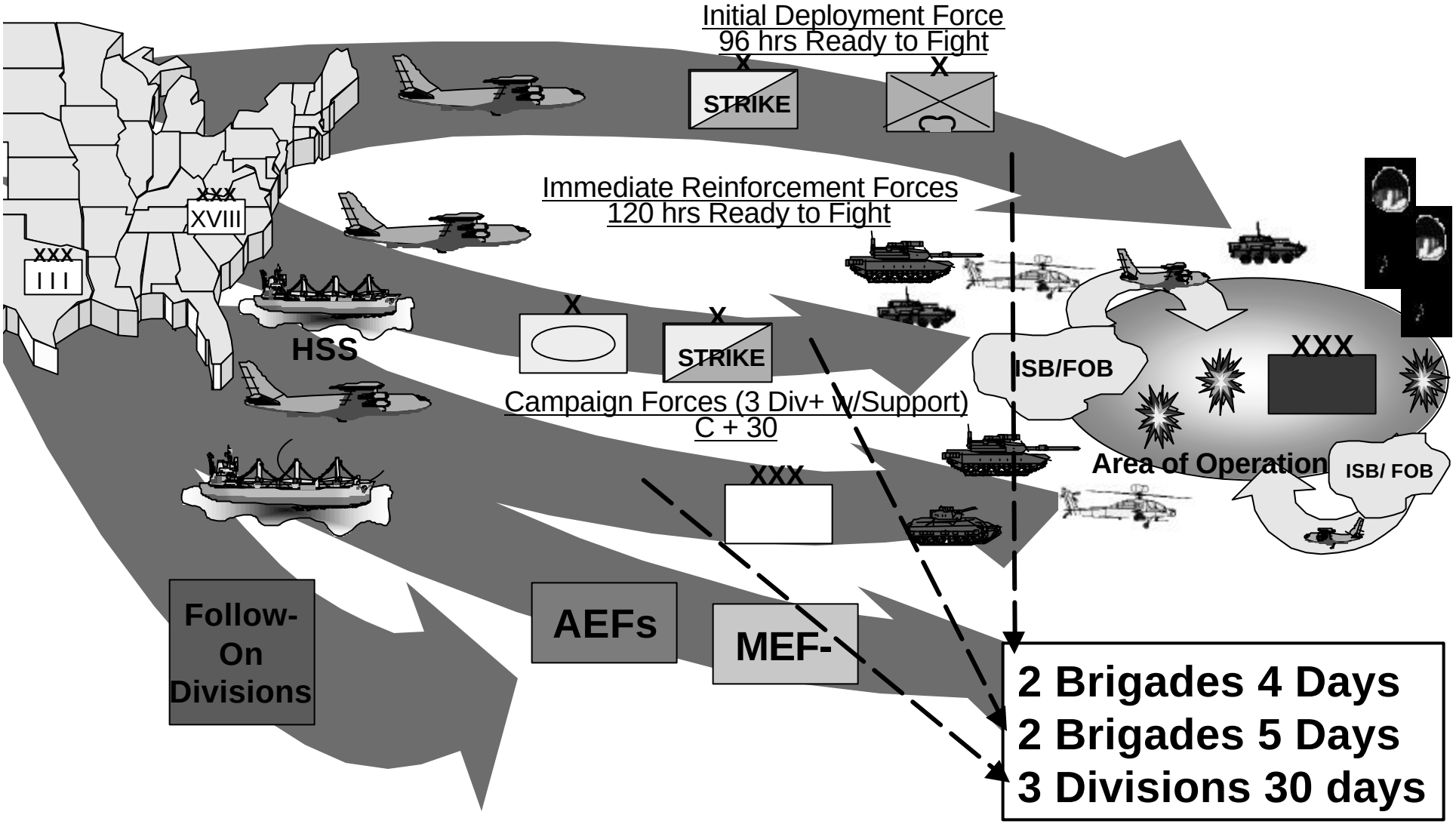
Fort to Fight, Ready to Fight!!

Our Mission
Terms of Reference - Investigate...

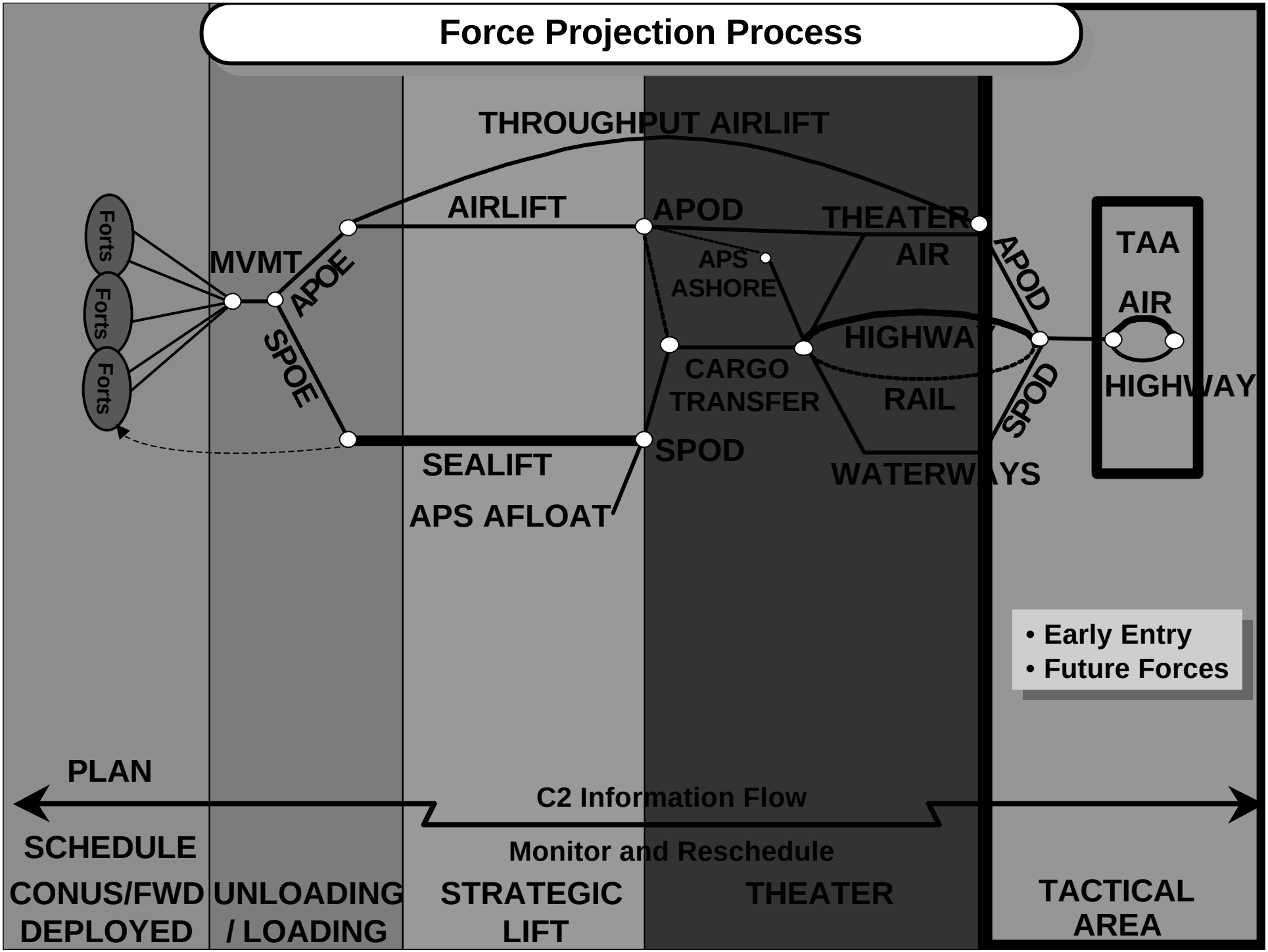
- Identify ***mobility enablers*** for early and continuous entry
- Address implications of ***enemy "anti-access" capability***.
- Identify ***enablers*** to actualize the full potential of the ***Revolution in Military Affairs (RML)***
- Review and assess ***Advanced Technology Demonstrations (ATDs),*** and ***Advanced Concept Technology Demonstrations (ACTDs)***
- Review and assess ***mobility related acquisitions***
- Identify opportunities for the Army/DOD to ***leverage commercial capabilities***
- Assess the current programmed assets to meet ***identified challenges and shortfalls***
- Provide ***actionable recommendations***, which have suitable ***Program Objectives Memorandum (POM)*** and ***Joint Requirements Oversight Council (JROC) implementation***

Purpose: Get More Combat Power Into the Fight Faster!

The Objective - Strategic Maneuver



Enabling Rapid and Decisive Strategic Maneuver for the Army After 2010


Force Projection Process
THROUGHPUT AIRLIFT
AIRLIFT
APOD
THEATER AIR
APS ASHORE
HIGHWAY
CARGO TRANSFER
RAIL
WATERWAYS
SEALIFT
SPOD
APS AFLOAT
MVMT
APOE
SPOE
APOD
SPOD
TAA
AIR
HIGHWAY
Forts
Forts
Forts
• Early Entry
• Future Forces
PLAN
C2 Information Flow
SCHEDULE
Monitor and Reschedule
CONUS/FWD DEPLOYED
UNLOADING / LOADING
STRATEGIC LIFT
THEATER
TACTICAL AREA

What We've Learned
Force Projection Process

Solutions to reduce deployment time must consider entire throughput process

- ***Deployment Tools***
  - Commanders do not have good automated movement planning tools
  - Scheduling, monitoring, and rescheduling tools are not timely
- ***Deployment Requirements***
  - Reducing logistics consumption reduces deployment requirement
  - Split basing can increase combat power availability ... may require organizational redesign
- ***Early Entry forces***
  - Immediate fixes are possible to increase lethality
  - Ceteris paribus, increasing lethality increases airlift requirement. ***Lethality must increase much faster than load***
- ***Follow On Forces***
  - Once ships begin arriving, their capacity outpaces air capacity
  - Making forces air-deployable increases airlift requirement
  - Multi-modal transport essential
- ***Commercial Capabilities***
  - Commercial lift capacity outpaced military lift capability but economic and technical changes are limiting their availability
  - ***Army not exploiting opportunities to obtain critical features in new commercial craft***

What We've Learned
Commercial Trends

National Land Freight

Consolidation & economics producing ***sparse trans continental rail "super highway"*** with likely result of ***decreased military rail access***

Worldwide Air Freight

Now 50 kt/day throughput, growing to projected 200 kt/day by 2025 (DOD is approx 8 kt/day).

Substantial conversions creating Army opportunity

Higher throughput airports

Worldwide Sea Freight

Fewer large (6-8,000 Twenty foot Equivalent Unit (TEU)) ***container ships, small number*** of very ***high capacity deep water ports*** and ***not many routes***

One thousand plus, 1,000 TEU ships (largely foreign flag) available

Militarily useful commercial RORO fleet (231) and US Military fleet (57) is static at best

Fast load/unload and transit ships offer great advantage to Army

Logistics

Revolutionary changes have already taken place in ***containerization, integrated use of tagging, tracking and optimization of throughput in real time using IT systems***

Commercial industry ***containerizes***; the ***military*** uses ***breakbulk***

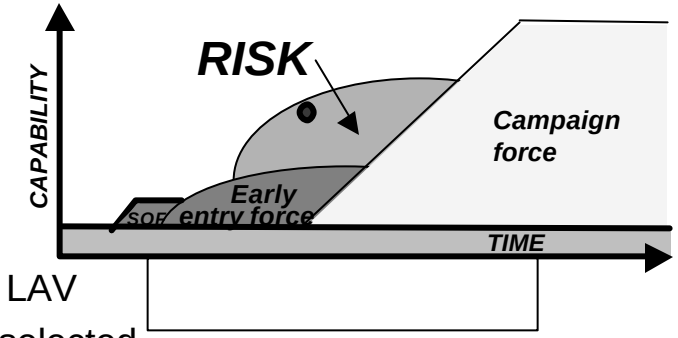
Strategic Maneuver
Leveraging Commercial Sealift

- **Problem**
  - ***DOD shipping is too slow***, takes ***too long to load and offload***, and requires ***too much water***
  - ***Commercial shipping***, useful to the Army, ***is too slow***, takes ***too long to load*** and offload, but does have ***more potential port access***.
  - ***Neither*** DOD nor commercial shipping ***has fast, austere port off load capabilities***
  - ***Army does not package units and equipment to exploit commercial shipping***
- **Discussion**
  - ***Sealift*** has been and will continue to be the ***primary transportation*** means for ***large army forces***, equipment, and supplies
  - VISA is decreasing in utility due to dwindling US shipping sector
  - ***Army has an opportunity to improve load / unload time by 75% and the port to port time by 40%***
  - Time window to influence High Speed Ships (HSS) opportunity is short and issues are complex
- **Recommendations**
  - Forward to the Navy revised Army requirements for Strategic Sealift to include HSS
  - Enter into partnership with the Navy and DOT to pursue actively Title XI support for HSS and the incorporation of National Defense Features (NDF) to support military cargo and austere port operations
  - Task SAALT to work with DARPA and Navy to develop technology alternatives to offload ships rapidly in austere ports
  - ***TRADOC should develop and promulgate Tactics, Techniques and Procedures (TTPs) for improving packaging and outload using containers, flat racks and other intermodal devices***

Strategic Maneuver

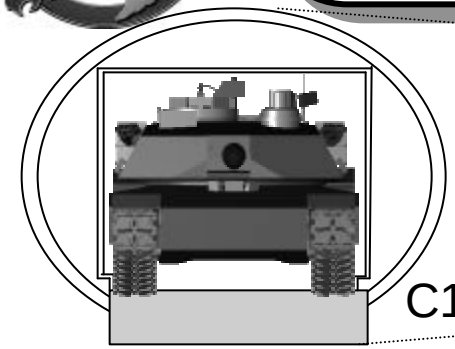
Increasing Lethality, Survivability, and Tactical Mobility of Early Entry Forces

- **Problem**
  - ***Significant deficiency exists*** in providing ***adequate lethality*** in ***early entry force*** to preclude enemy from achieving initial objectives
- **Discussion**
  - 2nd ACR assigned to XVIII ABN Corps
  - Variety of existing systems can provide ***enhanced lethality***, and are ***C-130 transportable***, e.g.,
    - Armored Gun System
    - Light Weight HIMARS
    - LAV
  - ***Deployment time*** of 2nd ACR could be ***decreased*** by having selected subordinate units organized to conduct ***split base operations***
  - ***Commercial packing*** (racks, containers, etc.) has potential to ***decrease loading time***



- **Recommendations**
  - Task ***TRADOC*** to experiment with ***alternative, available equipment*** and to recommend, within 12 months, needed procurements
  - Task ***TRADOC and XVIII Airborne Corps*** to develop ***split-based support options***, to include necessary organizational redesign
  - Work with ***TRANSCOM*** to determine ***appropriate deployment configurations (packaging)*** to reduce time
  - Develop the justification and ***approach DOD and Congress*** for funding in ***12 months***
  - Conduct ***Expeditionary experiment*** within ***24 months***

The C-130 Vehicle Deployment Requirement is a Major Challenge



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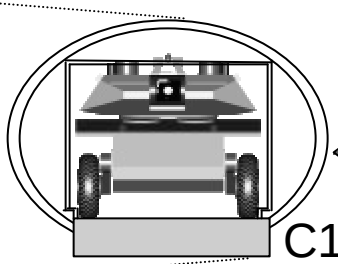

C130

Up to:
70% Lighter
50% Smaller

Current System
60-70 Tons
650 Cu. Ft. Internal Volume

Future Concept
20 +/- Tons
300-400 Cu. Ft. Internal Volume

Challenge is to provide a lethal, survivable capability in vehicles that are half the cube and a third the weight

40-year-old Aircraft Limitations Are Driving the Next Generation Combat Vehicle Design

Strategic Maneuver
Information Technology

- **Problem**
  - Army efforts to ***incorporate commercial information technology*** to permit achievement of JV-2010 have lagged
- **Discussion**
  - Commercial world is changing rapidly while military acquisition system is slow
  - Army does not employ a holistic approach, proven so powerful by commercial enterprises
  - Army needs an ***integrated information infrastructure (I.I.I.)***
    - Key supporting systems such as GCSS and ALP can be integrated
    - Will support such vital functions as tagging and tracking of containers
- **Recommendations**
  - Direct the Army Battle Command Systems (ABCS) GOSC to create:
    - An ***Integrated Product Team (IPT)*** to:
      - Prepare a ***clear vision of an I.I.I. (system of systems)*** based upon ***commercial standards, procedures and practices***
      - Develop an ***I.I.I. system of systems architecture***
      - Promulgate ***requirements to assure integration*** of individual programs into the I.I.I. system of systems architecture
  - ***Support effort to achieve a DOD-wide I.I.I.***

4-7 Day Early Entry and 30 Day Total Closure Can Be Achieved if the Army:

- Reduces the weight of early entry forces by 50% (70% for some platforms)
- Decreases container ship load / off-load time by 66%
- Decreases all other load / off-load time by 50%
- Employs 66 CRAF
- Doubles SPOD and quadruples APOD throughput capacity
- Employs 1.6 M short tons of sea lift (80 container ships)
- Exploits IT and III to coordinate and control timely, efficient transport

Implications for Industry

- Army products must be designed to fit the realities of the future transport system - it can't fight if it's not there
  - Increased use of commercial transport
    - Up to 50% lighter (70% for some platforms)
    - Up to 50% smaller
    - Commercial load and tie down features
    - Containerization
  - Entire transport problem must be considered in the design - consider the entire logistic system not just transit speed. For example:
    - Containerization
    - Roll on - roll off
  - Design the product to take full advantage of the advantage of real time IT systems and the future Integrated Information Infrastructure (III). For example:
    - Location
    - State of health
    - Need for impending services

Right Force at the Right Place and Time is Achievable

If We Make Getting There as Important as Doing Well While There